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# OFFICIAL   PATENT

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | | |
|---|---|---|---|
| Applicant: | WALCZAK ET AL. | ) | |
| | | ) | Examiner D. Le |
| Appl. No. | 09/769,122 | ) | |
| | | ) | Art Unit 2685 |
| Confirm. No. | 5562 | ) | |
| | | ) | Atty. Docket No. CS10560 |
| Filed: | 24 January 2001 | ) | |

Title: "Method And System For Validating A Mobile Station Location Fix"

## DECLARATION UNDER 37 C.F.R. § 1.131

Commissioner for Patents
Alexandria, Virginia 22313-1450

Sir:

The following Declaration and any attachments are to establish conception in the United States of claimed subject matter in the referenced patent application and diligence to the filing of the referenced patent application on 24 January 2001 from a date prior to the effective date of the following references relied upon by the Examiner to support rejections under 35 U.S.C. 102(e) and 35 U.S.C. 103(a) in the Office Action dated 10 November 2003:

United States Publication No. 2002/00198001 A1 (Bajikar) filed in the United States on 27 December 2000; and

WALCZAK ET AL.                                          Appl. No. 09/769,122
"Method And System for Validating A                          Confirm. No. 5562
Mobile Station Location Fix"                                  Examiner D. Le
Atty. Docket No. CS10560                                        Art Unit 2685


United States Publication No. 2002/0164993 A1 (Elliot) filed in the United States on 12 December 2000.


In support of this declaration, We, Thomas J. WALCZAK of Woodstock, Illinois, and William P. ALBERTH of Crystal Lake, Illinois, declare and sayeth the following:

That we conceived the claimed subject matter of the referenced patent application in the United States before the 12 December 2000, which is prior to the effective dates of United States Publication No. 2002/00198001 A1 (Bajikar) and United States Publication No. 2002/0164993 A1 (Elliot) in the course of employment by Motorola Inc., the assignee of the instant application by virtue of an assignment duly recorded on the Official record of the United States Patent & Trademark Office, REEL/FRAME 0111509/0088;

That the claimed subject matter of the referenced patent application was the subject of a written invention disclosure prepared after conception, and that before 12 December 2000 the invention disclosure was submitted to a Patent Committee of Motorola Inc., the assignee of record for consideration and assignment to a patent attorney for preparation and filing of a patent application;

That each of the dates redacted from the disclosure attached as Appendix I is prior to 12 December 2000;

That on information and belief a patent application was prepared and filed, in due course upon, in the United Stated Patent Office on 24 January 2001 by or on behalf of Motorola Inc.;

That all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true;

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WALCZAK ET AL.                                    Appl. No. 09/769,122
"Method And System for Validating A                Confirm. No. 5562
Mobile Station Location Fix"                       Examiner D. Le
Atty. Docket No. CS10560                           Art Unit 2685


and further that these statements were made with the knowledge that willful

false statements and the like so made are punishable by fine or imprisonment,

or both, under Section 1001 of Title 18 of the United States Code and that such

willful false statements may jeopardize the validity of the application or any

patent issued thereon.


_____  2/9/04          _____  2/10/04
Thomas J. WALCZAK      Date       William P. ALBERTH    Date


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Inventor(s) will not fill in
Operation  *A7A8 (Lindˌ )*
DISCLOSURE NO.  *CS-1056C*          DATE
Patent Committee Action  *Pursue*
Inventor(s) Name(s)  *Walczak, Alberth*

### DISCLOSURE FOR PATENT COMMITTEE

### SUBMITTED PURSUANT TO EMPLOYMENT AGREEMENT

### FOR INSTRUCTIONS FOR COMPLETION REFER TO DISCLOSURE INSTRUCTION PROCEDURE

Inventor must fill in items 1 thru 12.
Items 2 to 5 may require extra sheets. BE SURE they are signed, witnessed and attached.

1. Name of the invention. (Limit to ten words.)
   History based location assistance

2. State the problem(s) resolved by the invention.
   See attached.

3. Describe the invention in detail. Include its operation, purpose, environment and how problem(s) were solved. (Use separate sheets as required.)
   See attached.

4. What new elements (e.g. components, circuits, process steps) or combinations of known elements or software algorithm produced the improvement(s) over known technology?
   See attached

5. List the closest known technology (attach article, patent, catalog sheet or other documentation).
   See attached.

6. What are the potential applications for use of this invention?
   Any wireless device.

7. Conception date? _____  (Attach earliest log sheets, drawings, etc., to support dates).
8. To whom did you first disclose this invention?  Name:                    Advanced Inventing Sessi
9. Date the device was first built and tested. _____
   Present location of the device?  _____      Not built.

### DETERMINATION OF LEGAL INVENTORSHIP FOR PATENT APPLICATION MUST BE MADE BY THE PATENT DEPARTMENT.

Inventor's signature (IMPORTANT - YOU MUST USE YOUR FULL FIRST, MIDDLE AND LAST NAMES).

| 10. Inventor's Full Name: (Type) Thomas J. Walczak | Signature | Date | Social Sec. No. 396-72-7341 |
|---|---|---|---|
| Home Address:  Street 3070 Boerderij Way | City Woodstock | State IL | Country USA / Zip Code 60098 |
| Citizen of (i.e. U.S., Germany, Etc.) USA | Dept. No. BA503 / Phone 3-2293 | Room No. AS211 | Employee Status  X  Permanent / Contractor |

| 11. Inventor's Full Name: (Type) William P. Alberth Jr. | Signature | Date | Social Sec. No. 323-60-3466 |
|---|---|---|---|
| Home Address:  Street 1471 Woodscreek Cir | City Crystal Lake | State IL | Country USA / Zip Code 60014 |
| Citizen of (i.e. U.S., Germany, Etc.) USA | Dept. No. BA478 / Phone 3-2551 | Room No. IL46 | Employee Status  X  Permanent / Contractor |

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Page 2 - Disclosure No.

Security Classification
Motorola Confidential Proprietary    (when completed)

| 12. Inventor's Full Name:  (Type) | Signature | Date | Social Sec. No. |
|---|---|---|---|

| Home Address:    Street | City | State | Country | Zip Code |
|---|---|---|---|---|

| Citizen of (i.e. U.S., Germany, Etc.) | Dept. No. | Phone | Room No. | Employee Status |
|---|---|---|---|---|

Permanent ____ Contractor

Witness signatures (TWO WITNESSES ARE REQUIRED)
Witness must sign and date this form    *and all attachments.*
THE WITNESSES IN SIGNING THIS FORM ATTEST TO THE FACT THAT THEY UNDERSTAND THE INVENTION.

| 13. Witness Name (Type) | Signature | Date | Phone |
|---|---|---|---|
| David Haub | Aul Huh | | 847-533-2254 |

| 14. Witness Name (Type) | Signature | Date | Phone |
|---|---|---|---|
| Julie Winkelmann | Julie E Wink | | 847-323-2451 |

Items 15 to 25 are to be filled in by the ENGINEERING and MARKETING/PRODUCT MANAGER or equivalent. Use separate sheets as required.
THE MANAGERS IN SIGNING THIS FORM ATTEST THAT THEY UNDERSTAND THE INVENTION

15. What product will this invention be used in? (No code names — use brief description if necessary)
No Plans at this time

16. When (was) (will) the first offer for sale of a product incorporating this invention (be) made?
Date:        2nd Half 00

17. When is the estimated shipping date?                4th Quarter '00

18. When (was) (will) the first disclosure outside of Motorola (be) made? How and to whom? Nondisclosure agreement signed? State title and date of publication, if any.

2nd Half 00

19. What is the market for products incorporating this invention?

This invention may be applied to any cellular telephone technology since they all rely on handoffs and must know the approximate location of the mobile.

20. Who are the potential competitors? What is the possibility this invention will be used by competitors? Which ones?

Potential competitors are Sony, Samsung, Qualcomm, Nokia, etc.

21. Did this invention result from work on a development contract:  (YES) (NO) Contract No. _____
Who was the contracting party?
No

22. Discuss the business impact that this invention will have on Motorola. Be specific and quantitative.

Provides potential future differentiating feature or enhancement.  May impact future standards.

| 23. Engineering Manager's Name (Type) | Signature | Date | Dept. No. | Phone |
|---|---|---|---|---|
| Don Linder | Alexander Linder | | QA-960 | 3-8090 |

| 24. Product/Marketing Manager's Name (Type) | Signature | Date | Dept. No. | Phone |
|---|---|---|---|---|

25. The Manager must determine the security classification of this information. See Personnel Policy #840, and Corporate SOP E60, Protection of Proprietary Information.

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## 2. Problem resolved with the Invention

GPS will be widely used for locating cell phones in the future.  However, GPS is not 100% accurate and can give erroneous results.  Errors are mainly due to operation in

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*(when completed)*

Solution #2:

The technique of using past history to validate the present position may also be extended to storing and time stamping previous GPS fixes. This will work in much the same way as the previous example except that the use of neighbor lists is replaced by GPS fixes.

The analysis of past location information can be used to determine the accuracy of the present location fix. There are several examples of how this works 1) in tracking applications if there is a plotted point with significant deviation from the path of the average locations this data may be assumed to be erroneous 2) if the distance between the recent past location estimates and the present location fix would require the person to move at a velocity greater than is considered practical the fix can also be considered erroneous.

4. **What new elements (e.g. components, circuits, process steps) or combination of known elements or software algorithm produced the improvement(s) over known technology?**
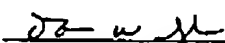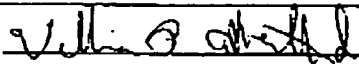
We would write claims to cover:
  a. Storing in the cell phone time stamped histories of neighbor cell measurements and previous GPS fixes.
  b. Storing in the base station (or switch) time stamped histories of users neighbor list and previous GPS fixes.
  c. Using the history information to develop confidence in the GPS fix.
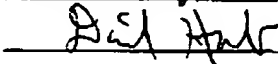
5. **Prior Art**

Triangulating off neighbor cell measurements is a known method to determine location. But using a history of measurements to assist in location is not known.

Inventor(s) Signature(s)/Date(s):

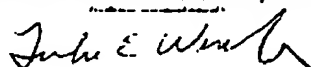Witness Signatures/Dates:

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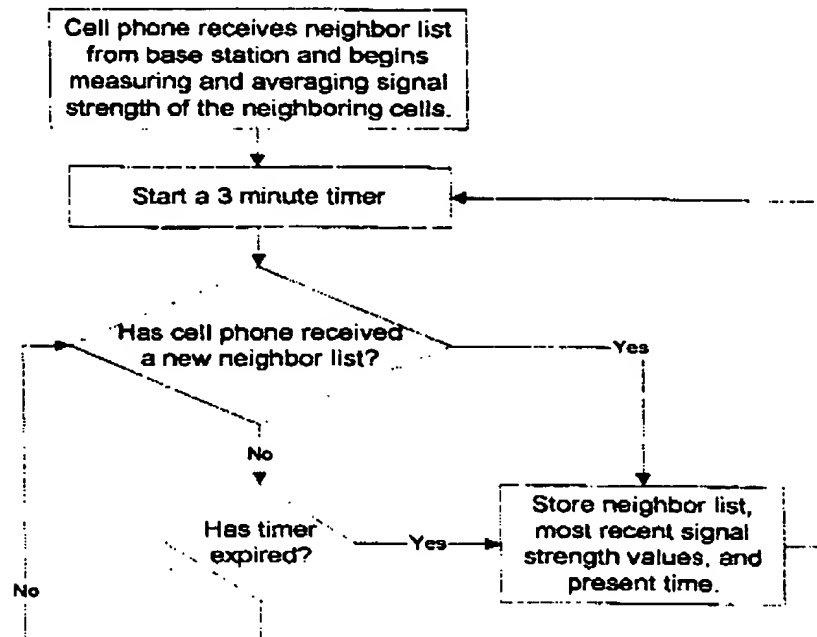Page 5 — Disclosure No                    Motorola Confidential Proprietary

Figure 2. Method of Storing Neighbor List History

Inventor(s) Signature(s)/Date(s):

Witness Signatures/Dates:
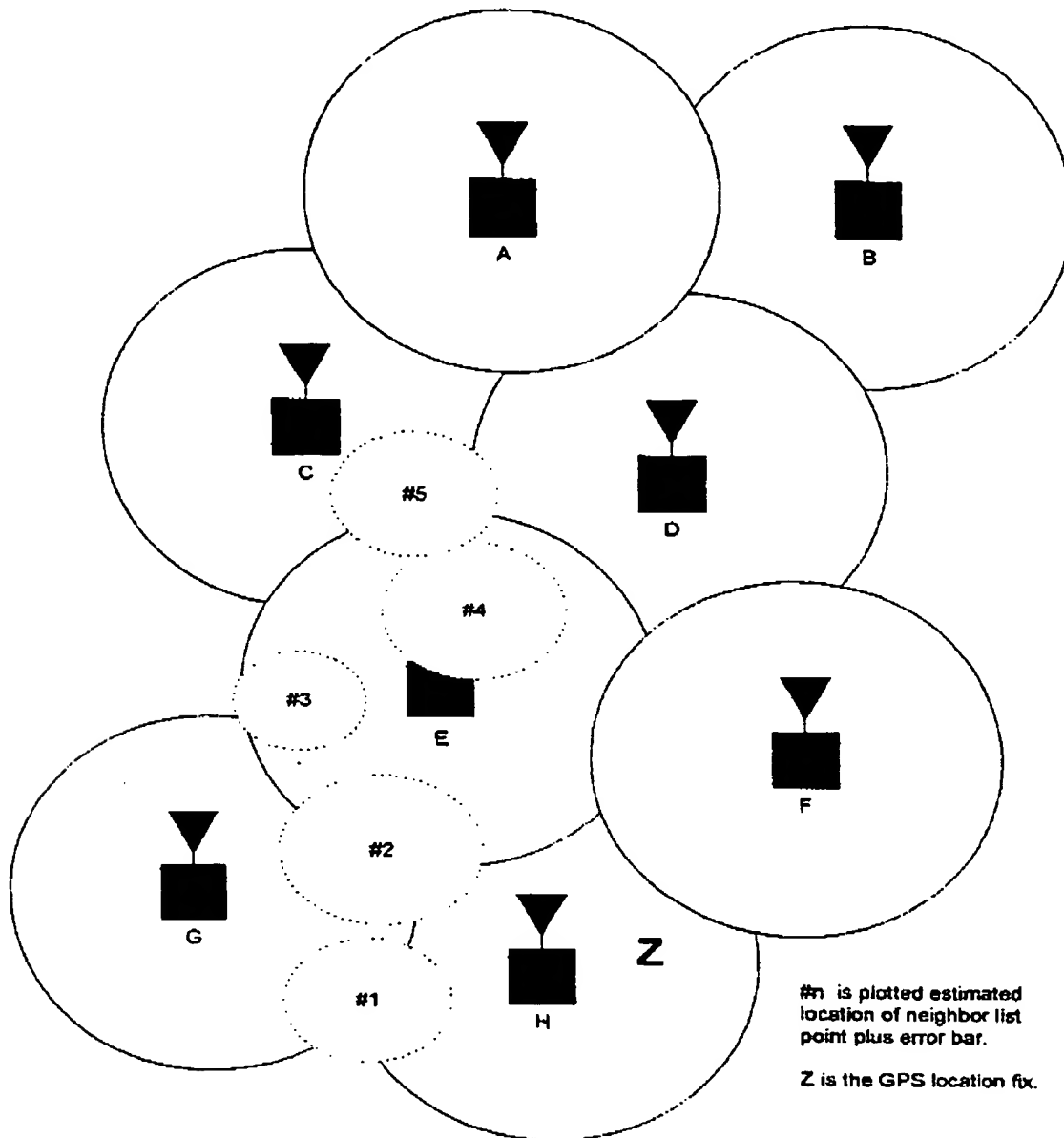
Figure 3. Cell Site Map with History Points and GPS fix plotted

#n is plotted estimated location of neighbor list point plus error bar.

Z is the GPS location fix.

Inventor(s) Signature(s)/Date(s):

Witness Signatures/Dates

```
┌─────────────────────────────────────────┐
│   Cell phone user initiates an E911 call. │
└─────────────────────────────────────────┘
                     │
                     ▼
┌─────────────────────────────────────────┐
│  Cell phone takes a GPS fix and downloads │
│ position reading plus neighborlist history file to│
│            base stations.                 │
└─────────────────────────────────────────┘
                     │
                     ▼
┌─────────────────────────────────────────┐
│ Base station compares history of neighbor list│
│ readings with database of location vs readings,│
│  and determines possible location circles for│
│            each history point.            │
└─────────────────────────────────────────┘
                     │
                     ▼
┌─────────────────────────────────────────┐
│  History location estimates plus GPS fix are│
│      presented on a map to an operator.   │
└─────────────────────────────────────────┘
                     │
                     ▼
┌─────────────────────────────────────────┐
│  Operator assigns confidence to GPS reading.│
└─────────────────────────────────────────┘
                     │
                     ▼
┌─────────────────────────────────────────┐
│  If confidence is low, cell phone is ordered to│
│        take another GPS reading.          │
└─────────────────────────────────────────┘
                     │
                     ▼
┌─────────────────────────────────────────┐
│ GPS data plus history information is passed to E911 operator│
│   for dispatch of emergency response personal.│
└─────────────────────────────────────────┘
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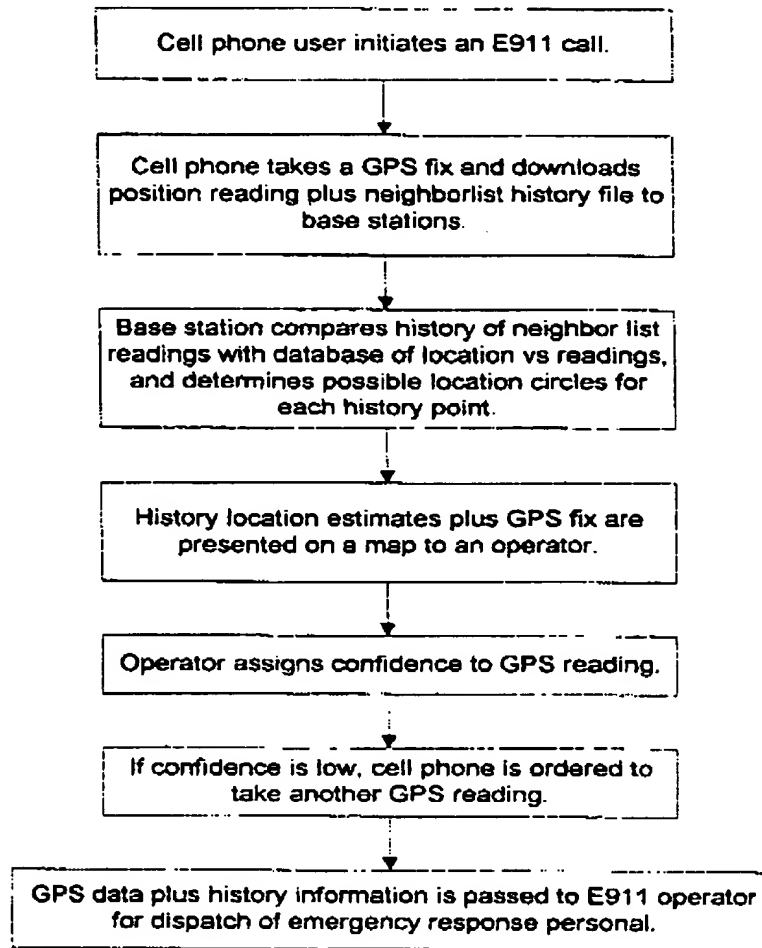
Figure 4.  Method of Processing History Points and GPS Fix

Inventor(s) Signature(s)/Date(s):

Witness Signatures/Dates: